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U.S. DEPARTMENT OF COMMERCE National Technical Information Service

AD-A034 195

SRDS TECHNICAL PROGRAM DOCUMENT, FISCAL YEAR 1977
ENGINEERING AND DEVELOPMENT APPROVED PROGRAMS

FEDERAL AVIATION ADMINISTRATION, WASHINGTON, D.C.

**OCTOBER 1976** 

SRDS

ADA 0341

TECHNICAL PROGRAM DOCUMENT

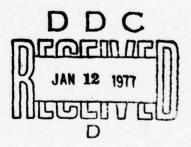


FISCAL YEAR 1977
ENGINEERING & DEVELOPMENT APPROVED PROGRAMS



OCTOBER 1976

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Systems Research & Development Service
Washington, D.C. 20590

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## TECHNICAL PROGRAM DIRECTIVE

 $\frac{1}{7}$  No.  $\frac{2}{3}$  No.  $\frac{1}{7}$  through 21

SUBJECT: FY-77 SRDS Annual Technical Program

The enclosed FY-77 SRDS Annual Technical Program Document (TPD) establishes the Subprograms approved for implementation by the Director of SRDS. The implementation of these efforts is subject to the availability of resources.

This Annual Technical Program will be under continuing review and will be updated by means of Technical Program Directives as technical and other requirements dictate. Resumes in this Technical Program Document are structured according to the FAA Engineering and Development Programs 01 through 21.

DAVID J. SHEFTEL

Director, Systems Research

and Development Service, ARD-1

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<sup>1/</sup> Fiscal Year

<sup>2/</sup> Sequence of Technical Program Directive Issuance, coded and controlled by ARD-50/54.

<sup>3/</sup> FAA ED Programs (per FAA-ED-00-C as amended).

## **Technical Report Documentation Page**

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This FY-77 Technical Program Document (TPD) contains Research and Technology Resumes which reflect Systems Research and Development Service, Federal Aviation Administration, approved subprograms. These resumes identify the technical objective, approach, milestones scheduled for accomplishment, end-item products, and FY-76 accomplishments, and source of requirements.

The TPD is structured according to the following 21 Engineering and Development Programs:

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01	System	11	ATC Systems Command Center
02	Radar		Automation
03	Beacon	12	Enroute Control
04	Navigation	13	Flight Service Stations
05	Airborne Separation	14	Terminal/Tower Control
	Assurance	15	Weather
06	Communications	16	Technology*
07	Approach and Landing	17	Satellites
	Systems	18	Aircraft Safety
08	Airport/Airside	19	Aviation Medicine**
09	Airport/Landside*	20	Environment
10	Oceanic	21	Support
	03 04 05 06 07 08 09	02 Radar 03 Beacon 04 Navigation 05 Airborne Separation Assurance 06 Communications 07 Approach and Landing Systems 08 Airport/Airside 09 Airport/Landside*	02       Radar         03       Beacon       12         04       Navigation       13         05       Airborne Separation       14         Assurance       15         06       Communications       16         07       Approach and Landing       17         Systems       18         08       Airport/Airside       19         09       Airport/Landside*       20

The fourth Arabic number in the Current Number/Code in block 10a of the Resume (i.e., 013-150) identifies the responsible lead division in SRDS, i.e.,

- 1 = ARD-100 Air Traffic Control Systems Division
- 2 = ARD-200 Communications Division
- 3 = ARD-300 Navigation Division
- ARD-400 Airport Division
- Aircraft and Noise Abatement Division 5 ARD-500
- ARD-60 Spectrum Analysis Staff
- Microwave Landing System Division ARD-700

Comments and recommendations concerning this TPD may be directed to the Chief, Program Management Staff, ARD-50.

Transferred to OSEM

Not included

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3. KEYWORDS			L	MA	
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tions, based cal reports) further work  26. Milestone . Report	By 9/30/76 mileston only on literature se related to anti-colli the 9550 request from es Scheduled for Accompananti-collision light	earch, acquision light AFS would aplishment:	isition, and s. Use 9/30/ need.	digest (of all	recent techni-
	ne further work needed ion lights support to		te aircraft		10/76
26A. Accompl:	ishments FY-76:				
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	L. Brennan, ARD-250		ASSOCIATE		
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6. Milestones	Scheduled for Accomp	lishment:			
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	Enhanced Active BCAS			11/7	
. Active &	semi-active BCAS Cor	ntract Awar	d	6/7	
. Draft BC	AS National Standard			7/7	
. Final BC	AS Report			3/8	0
6A. Accompli	abmenta EV-76				
.bA. Accompil	shments FY-76				
. Basic Ac	tive BCAS Feasibility	y Demonstra	ted		
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	(202) 426-9354			ASSOCIATES		11081
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	Data link cont	rol procedur	es standard	- finalized	8	177
	Message format	s standards .	drafted		9	/11
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	econd Street, S. W.		4 DOR COM		
washing	ston. D. C. 20590				
Sherma	n P. Tynes, ARD-221		PRINCIPAL:		
	426-0986		ASSOCIATE:		
I. VECHNOLOGY UTIL			21. COORDINATION		YPE
	NA		NA.		
3. KEYWORDS					
A/G, RADIO CO	MMUNICATIONS, VOICE T	RANSMISSION,	REMOTE SITE	, RADIO CONTROL,	ANTENNA
<b>a.</b>	iective: To improve				
evaluate and particular and particul	SRDS with NAFEC, other provide for field use tions through new or to a replacement radio of tive monitoring capabil	, advanced r updated mult ommunication	adio and radi	io control system r/ground faciliti	s suitable for es. Efforts
Milestones	scheduled for accompl	ishment			
Complete And	tenna System Study		9/77		
	dio Control Procureme	nt Pkg	7/77		
Production	RCCS Specification		4/80		
26A Accompli	shments FY 76:				
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	ond Street, S.W.		ADDRESS		
Washing	gton, D, C. 20590				
	D 14 - 1 - ADD 222		PRINCIPALI		
	R. Monnie, ARD-223		ASSOCIATE		
(202) 426			EL COORDINATION		7778,
	NA		NA		
. 45700/04					
	ATIONS, TERMINAL				
· Technical C	Objective: To provide	the agency	with reliable	and consolida	ted terminal
a commun	d inter-station operation operation of the SRDS, with NAFEC state of the SRDS, witching systems of the SRDS, witching systems of the SRDS	and contra stem for u	ctor support, se in large Fli	ight Service S	
	s Scheduled for Accor				
. Engine	ering Requirement		1/77		
	pe Contract Awarded		4/77		
	y of System		4/78		
	d Evaluation of System	n	6/78		
	tion of T&E		8/78		
. Techni	cal Data Package		10/78		
26a. Accomp	olishments FY-76:				
	inal Terminal Commu				
Switchi	ng System Specification	on delivere	d		
	Requirement			Totals	
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	econd Street, S.W.		ADDRESS		
Washi	ngton, D.C. 20590				
Arthu	r K. Kingsley, ARD-	222	PRINCIPAL:		
	426-8500		ASSOCIATE:		****
TECHNOLOGY UTILI			22. COORDINATION		
	NA		NA NA		
Digital Com	munications Network	Message	Switching Sv	stems Automat	ion
•	Objective: To design				
for the insign defi modate in-house under ba	h: SRDS, with contract nitial National Airspa nition will continue to required NADIN enhan contractor aided sup seline NADIN.	ce Data Into provide accements.	erchange Net dditional fund These enhan ontinuation o	twork (baseline ctions and service cements will be	NADIN). De- ces to accom- met through
. Initial	Technical Data Packa	age hand-of	ff to AAF		
	DIN Enhancement Ph			5/77	
	data package hand-off	to AAF for	NADIN		
	ement Phase I			11/77	
	de technical support to			Continui	ln.a
	N procurement and im lishments FY-76:	piementati	on	Continui	ing
	eted the initial NADIN	V study and	design		
	the initial baseline N			ackage	
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	and St. S. W.				
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e performance r automatic stature ATC come equived. SRDS ine its relative	udies will be cond parameters and entus monitoring, for munication system, with AAT and AA restoration prior entured for Accomp	conomic a cult trend s. Valida AF, will st rity.	spects of hard detection, and tion models w	lware/software I control of exist ill be developed	techniques sting and where
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202-426	-8500		rec: 346-380	)8	1196	
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	RDER, AUDIO AMPI					
	bjective: To provide				nents and	
sustaining e	NAFEC, with contracing efforts.	They will i	nvestigate pr	roblems, develop	and test	
	Scheduled for Accomp					
	rt on Field Test and				System 4/77 1/77	
	r/AC Reproducer Te tude Selector Unit Te				2/78	
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	cond St. S.W.		ADDRESS		
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Newe	1 R. Anderson, ARD-	220	PRINCIPAL:		
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TECHHOLOGY UTIL	IZATION		22. COORDINATION		TYPE
	NA		. NA		
RCA	G MONITORING, EME MOTING, WEATHER MI	RGENCY	LOCATOR TE	RANSMITTER, I	RADAR
specify RC for aircraft and networ	SRDS, with contractor AG monitoring equipment emergency locator to k as required; modern links (RML).	nents; deve ransmitter	elop sensor sp r (ELT); upgra	ecifications and ade the compute	d procedures erized WMSC
6. Mileston	es Scheduled for Acco	mplishmer	nt:		
	CAG monitor sensors			ed 8/76	
	sor specification and p			11/76	
	ultipoint procedures r		mplementation		,
	L project report comp	oleted		1/77	
RCAG m	ishments FY-76: conitoring sensor investigated DOT-FA76WA-3				
27. Source of	Requirement 9550s; AA 5, AFS-106-75-149	T-300-17,	28. B	Lunk	
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07 APPROACH AND LANDING SYSTEMS

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Wash.	D.C. 20591		INVESTIGATORS I OO		
	Fisher, ARD-421		ASSOCIATEI	Reamer, ANA	4-440
1. TECHNOLOGY UTILI			TEL: 8-34	16-3712	TYPE:
	<b>N</b> A		×	NA	
J. KEYWORDS	Equipment, Marker L	ighte 1	7isibility V	Tigual Signal	e
reliable a term engin	SRDS with NAFEC aversystems and equitand lower cost instance assistance such accurate the scheduled for Accurate the scheduled fo	pment in allation to opera	n order to proper service	rovide safer, provide criti	more
Report on Report on Baffle for	testing of fibergl lime green runway MALSR sequence fl tion data on lighti y VASI spec data fo	ass appr marking ashing l ng and m	roach light s light marking for t	curf runways	3/77 8/77 9/77 6/78 8/78
End-Item	Product Accomplishm	ents		,	
	ted final report on ted by letter	tests a	accomplished	(1971-1975)	
Report on	Runway Lights for	Non-Fred	cision instru	ment Approac	hes
27. Source of AS-502-76-	Requiremen#9550-1, AA 2. Letter Request f	S-502-76 rom_Stat	e of New Jer	FAA-ED	02-76-3, 07-3
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H.H. Butt	s, ARD-741 8605		INVESTIGATORS PRINCIPALI ASSOCIATES		
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Wash. D.C. 20590  Wash. D.C. 20590  Wash. B.C. 20590  Wash. B.C. 20590  Wash. H.H. Butts, ARD-741  A. (202) 426-8605  Technocov utalization  NA  Reveals  Instrument Landing System Glide Slope Localizer Cat I-III  Technical Objective: To develop equip., tech. & stand. to performance of the conventional ILS under all conditions of the conventional ILS under all conditions of the conventional ILS under all conditions of the severe siting & weather conditions; provide math & standard severe siting & weather conditions; provide math & standard severe siting & weather conditions; provide math & standard severe siting & weather conditions; provide math & standard severe siting & weather conditions; provide math & standard severe standard for Accomplishment:  Dev. Far Fld. Loc & GS Monitors, 1/78 - Dev. Boradside, Elmage Arrays, 4/79 - Dev. large aperture TW/slotted cable backcourse localizer, 12/77 - Update/operate Scal Model IV validate & Exercise Math Models. Use Model to Invest. FF Dev. doppler/ILS distance technique, 4/78 - Resolve St IL transient problems, 10/76 - Dev. automated maintenance daysystem, 6/78 -Dev. Improved remote ILS Status & Control St Accomplishment for FY-76  SS ILS Lightning/transient protection system implemented. med slotted cable loc. arrays. Installed end-fire GS at vironmental testing. Preliminary ILS math model available combined loc. array at LaGuardia. Loc. math model in ope Completed precision ILS calibrator deve. Specs. ILS TW and detector. ILS scale model installed at NAFEC. Interim reputer. Installed/tested frangible GS masts & antenna loops of the control of the second requirement of the second requ	
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	Fisher, ARD-421		ASSOCIATES		
202)	426-8454 EATION		TEL: 8-34	16-3712	TYPE:
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23. KEYWORDS					
Lighting Ed	quipment Frangible	Structur	es Airport	Beacons, Visi	bility
Approach: systems wh frangible d) control guidance,	SRDS w/NAFEC & consider are safer, more ALS, b) Displaced equipment e) Taxing) New light source VFR airports.	ntract su e reliabl threshold way & run	e & less co:   ALS c) Imp:  way lighting	stly includir roved circlir g f) Visual v	ng a) ng guidance vertical
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	bjective: To deve						
	aircraft during	landing,	rollout an	d taxiing in	Category		
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aircraft and changes to to allow to results, the ditions are developed.	SRDS with NAFEC at III lighting system of the Category III esting of the system low visibility esuitable. Taxi Improved flight the cockpit fog	tem to property description to	rovide bett ts. The ne system wil od weather fog simulat tion guidan a by use of	er guidance f cessary addit l be determin and to provid or will be us ce lighting w Video Tape r	or large ions and ed. In order e expeditious ed when con- vill be		
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Des 210	00 2nd St. S.W.		ADDRESS		
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P. INDIV.: T.	ohn F. Hendrickson, AR	D-7/3	PRINCIPAL: ASSOCIATE:		
	202) 426-8605	D-/43	TEL		TYPE:
TECHNOLOG	Y UTILIZATION NA		22. COORDINATION	NA	
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	metry, Approach and La	nding. Fl	ight Safety		
Techr	nical Objective: To p	erform st	udies and d	levelop system	s to elimin
error	s in altitude informa	tion as a	contributi	ng cause of a	pproach
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Appro	ach: Using contracto	r support	, operation	al systems an	d improved
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	2) 426-8427		TELI		TYPE
TECHNOLOGY UTILIZ	NA		22. COORDINATION	NA	
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\*Joint program with USAF provided funds are available. I 081-461

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(202)	1 Deliman, ARD-112 426-9372		PRINCIPALI HAY ASSOCIATE: TEL: 8-346-30	ry Haugan, AR	RD-140
TECHNOLOGY UTILIZA	NA NA		22. COORDINATION	NA	
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	2nd Street,	SW		ADDRESS:		
Washi	ington, DC	20591				
				INVESTIGATORS PRINCIPAL:		
		le , ARD-110		ASSOCIATE:		
	2) 426-1394			TEL:		TYPE:
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sufficien	t capacity,	improved per	formance	and increased	productivity.	
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6 Milestone	s Schedule:					
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Engineer	ing Requires	ents Electro	nic Tabula	r Display (ETA	BS)	12/76
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Source of Re	quirements:	FAA-ED-12-2	ZA T	1		
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Washing	ton, D.C. 20591		ADGARSSI		
			INVESTIGATORS PRINCIPALI		
P. INDIV.: Parker	Harris, ARD-111		ASSOCIATE:		
(202)	426-9372		TEL:		TYPE:
TECHNOLOGY UTILI	NA		22. COORDINATION	RTA	
KEYWOROS	NA .			NA	
	splay, Recording, Beac				
and evaluat	A breadboard radar dis ed by both NAFEC and designed system will b CCC software which wated.	a contracto	r under SRDS	management directlysis of both sys	tion. A stems will be
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. Milestones	Scheduled for Accomp	lishment:		11/76	
Begin eval	uation of CCC Softwar	e change		11/76	
Delivery o	of Beacon Improvment T	ech Data Pa	ickage	1/77 3/77	
Display Re	cording comparative e	valuation c	completed	•	
Tech Data	Package CCC Software	Beacon Fals	se report fix		
Final Repo	ort for prototype disp	lay record	ing evaluation	n 0///	
Delivere Delivere Complete	shrent for FY-76: d technical data packed technical data packed evaluation of movined interim report for	age for Aut g Target Ex	omatic Lead   tractor and	Edge select leat	ire on CD.
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er: (202)	el Deliman, ARD-112 426-9372		PRINCIPALI ASSOCIATEI		TYPE:
TECHNOLOGY UTIL	NA NA		22. COORDINATION	NA	
KEYWORDS					
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specify automati	n: SRDS and NAFEC with a develop, test, and evalon enhancement efforts estions, as well as processes into the en route e	luate the specified edural cl	many aspects d under Item 24 manges, will be	and applicati	lons of the
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	lete Conflict Alert Enhance		Development		4/77
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	ver Local Flow Control			ndate	9/77
	lishments for FY-76	rese mepe		pauce	.,
E-MSA	Experimental demonstra	tion com	plete		
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THE RESERVE OF THE PERSON NAMED IN	ict Alert Low Analysis a	nd Recom		Tete	
· Source of	Requirement FAA-ED-12-	2A	28.		
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(202) 426-0960			TELI		-
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	426-9372		TEL:		TYPE
VECHNOLOGY UTIL	NA NA		28. COORDINATION	NA	•
RE YWORDS					
Software,	Model, Operational Sy	stem			
automation specificat	evelop, test, and evalue enhancement efforts s ions, as well as proce- hanges into the en rou	pecifi <b>e</b> d <b>u</b> dural chan	nder Item 24. ges, will be o	Software and	hardware
6. Mileston	es Scheduled for Accom	plishment:			
	IPC/ATC Interaction Re		10/76		
	NCP Testing Complete	port	12/76		
	POFA Testing		3/77		
	e II Design		9/77		
A. Accompli	shments for FY-76:				
En Route	/IPC Interface Input as e I En Route Interface	nd Display Design an	Improvement d Testing Com	Tests Complete	
· Source of	Requirement FAA ED 1	2.24	28.		
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26A. Accom	lishments for FY-76:				
NADIN	/9020 Interface Contro	1 Document	Issued		
Integ	rated National Airspac	e Communica	tion System c	oncept report re	eviewed
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1-122-116				N/A	
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Wash., 1	O.C. 20591	•			
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	426-0960	der Beringte	TELI		TYPE
TECHNOLOGY UTIL	NA NA		22. COORDINATION	NA	
KEYWORDS			<del></del>		
Sy	stem Support Facility,	Software	Production To	ols	
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Milestones	Scheduled for Accompl	ishment			
Unit Test	Driver (UTD) Requirement	nto Defini			
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6A. Accompli	shments for FY-76				
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	d Street., S. W.		ADDRESS.		
Wash.,	D.C. 20591				
			INVESTIGATORS		
. INDIV.: D Sche	ffler , ARD-112		ASSOCIATED Ha	rry Haugan	
n: (202)	426-9374		TEL 8-346-30	11	1174
. TECHNOLOGY UTILIS			22. COUNDINATION		
	NA			NA	
. KEYWORDS					
CO	nputer efficiency, soft	ware, hardw	are		
low-risk, h agreed upon developed a	From previous studies sigh-payoff candidates by a working group ound tested at NAFEC.	f SRDS and The end pro	itial candida personnel fro duct will be	tes plus others m the user servi	which will be ces will be
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	lan complete		3/77		
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	ild design verificati		8/77		
First bu	ild operational evalu-	ation '	11/77		
First bu	ild technical data pa	ckage deliv	ery 12/77		
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			INVESTIGATORS PRINCIPAL:		
	gbert, ARD-113		ASSOCIATE		
	26-9360		TEL		TYPE
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13 FLIGHT SERVICE STATIONS

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YEL:		6-9393		TEL:		TYPE:
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	Young, ARD-442 26-9393		ASSOCIATE:		
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	ngton, D.C. 20591				
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16 TECHNOLOGY
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(202) 426-		,	ASSOCIATE:		
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	ction as regards pilot	certifica	cion training	and currency re	quirements.
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19 AVIATION MEDICINE
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20 ENVIRONMENT

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II. YECHNOLOGY UTILIZATION NA		22. COORDINATION NA		
Aircraft Noise, Jet Noise, Core E	landan Mada		ntion Treatment	
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<ul> <li>Jet Noise Suppression Design</li> <li>Airframe Noise Prediction and</li> <li>JT8D Mixer Study Report</li> </ul>		Mode1		- 11/77 - 5/77 - 11/7
26A ACCOMPLISHMENTS FY-76  • Jet Noise Suppression, Report • Configuration Effects Report • STOL Configuration, Jet/Flap • Business/Executive Jet, Evalu • V/STOL Noise Predictions for • B-727 Flyover Jet Noise Analy • V/STOL Rotary Propulsors Pred	Published Investigat ation of N YC-14, YC- sis for Su iction Mod	ion Report Pub oise Abatement 15 and Optimiz	lished Alternatives B ed STOL Craft C	Completed
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